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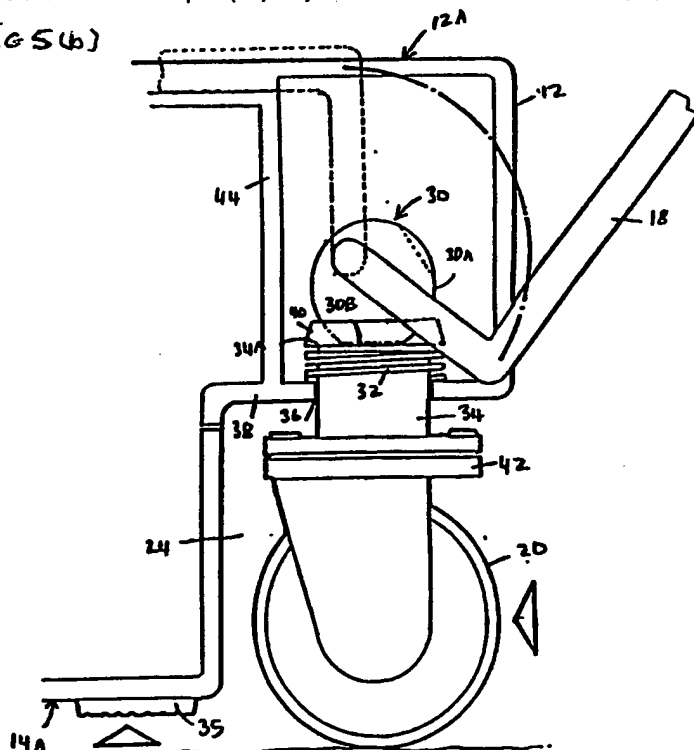
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UK CL (Edition K) A4G, B8P PW  
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## (54) Wheeled suitcase

(57) A wheeled suitcase which may be used as a trolley comprises at least three wheels of which at least one (20) is retractable and means for moving the retractable wheel (20) in a direction generally perpendicular to the plane of the lower major face (14A) of the suitcase body (10), between an operative position in which the wheel (20) can engage the ground and an inoperative position in which it is raised from the ground. The means for moving the wheel (20) may comprise an eccentric cam device (30) which may be operated by movement of a handle connected to the suitcase from a retracted to an extended position. A rubber friction pad (35) may act as a brake when the wheel (20) is retracted.

FIG 5(b)



The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1990.

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Fig 1

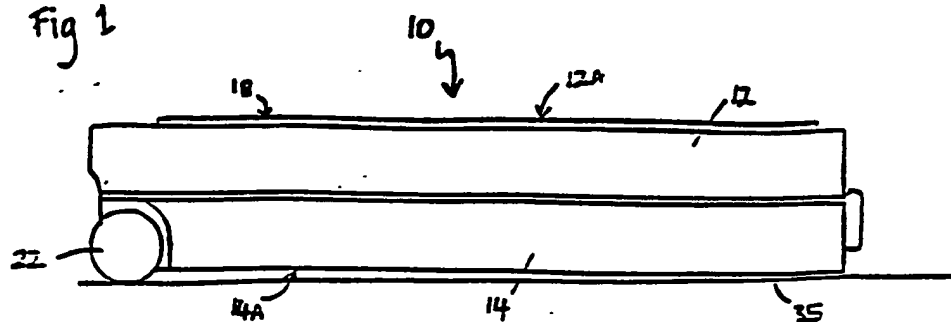


Fig 2 a)

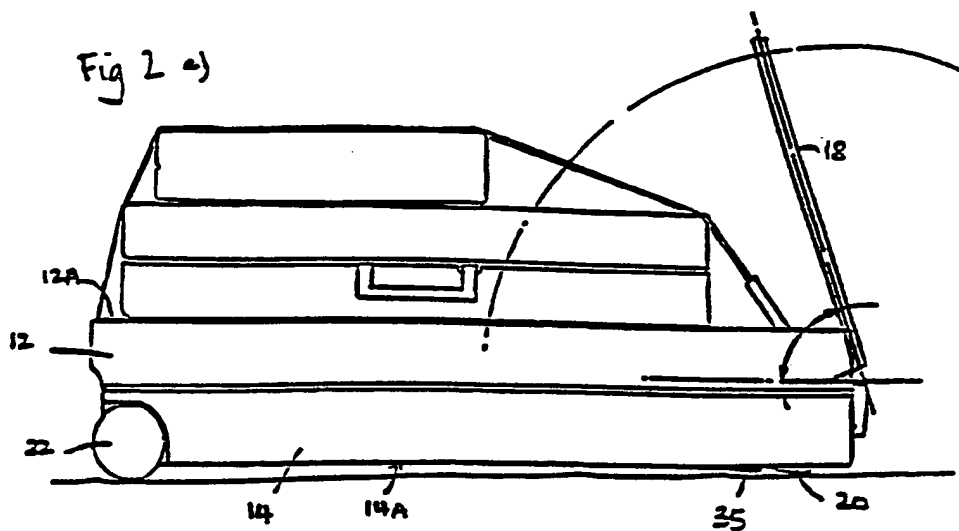


Fig 2 b)

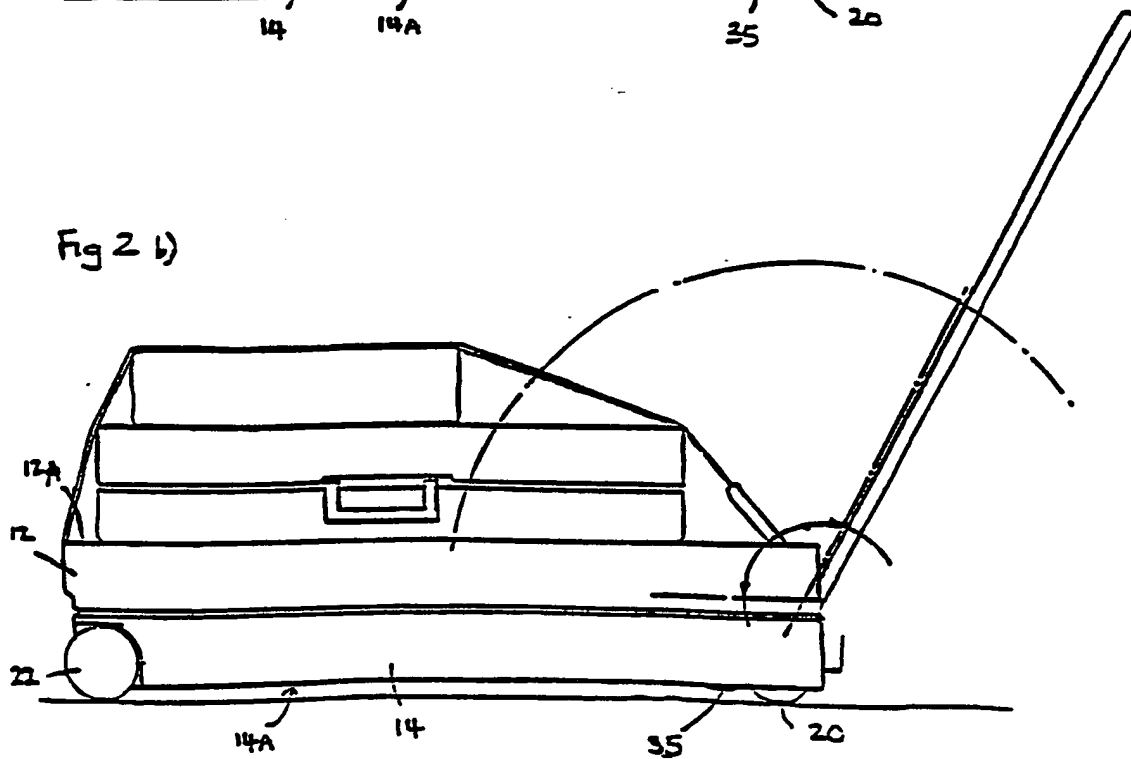


Fig 3

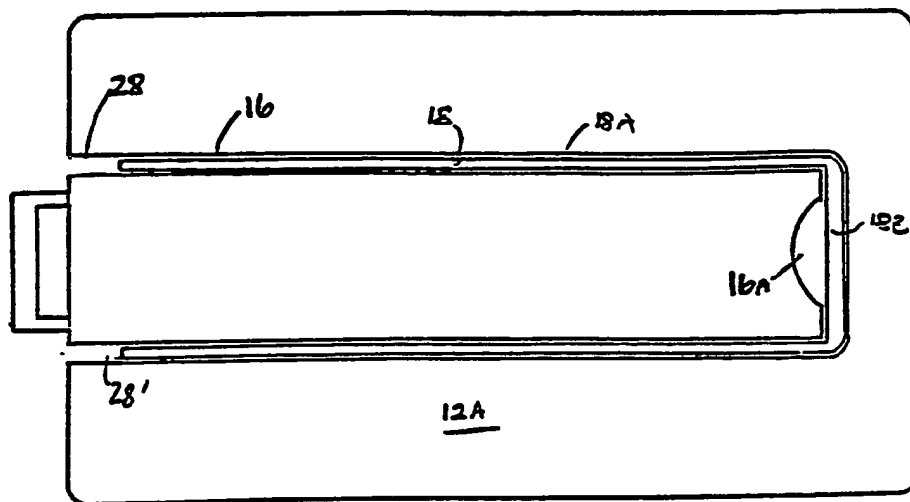


Fig 4

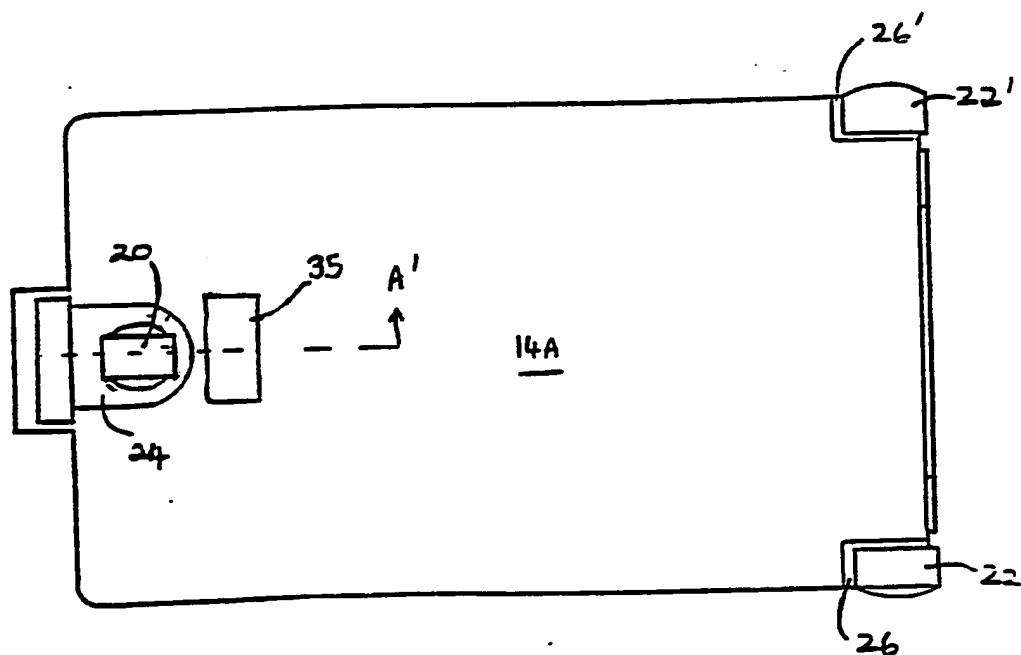
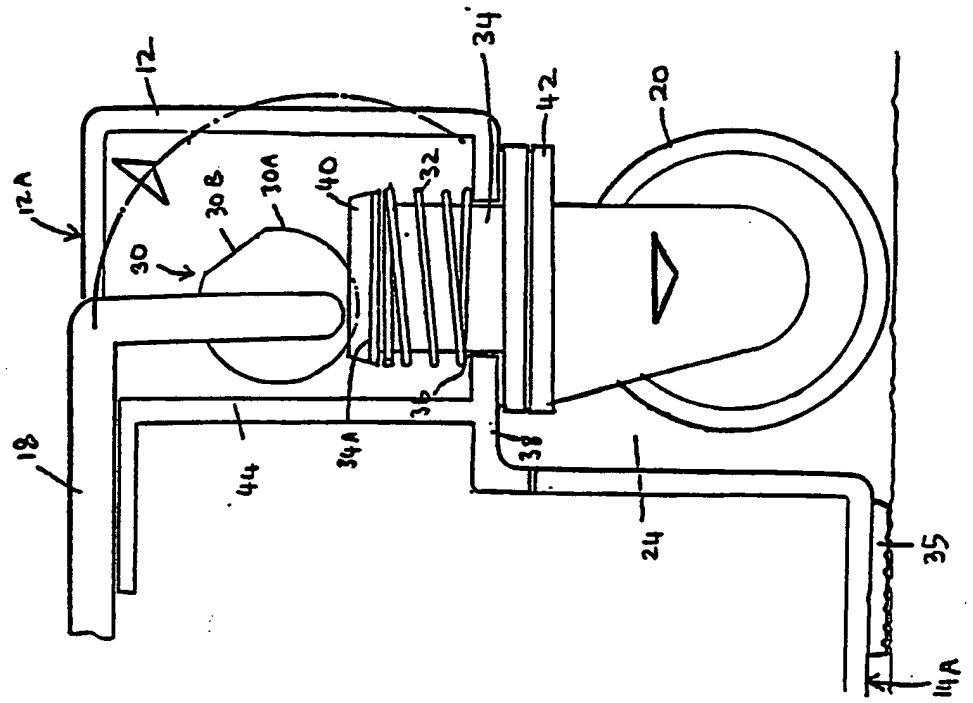
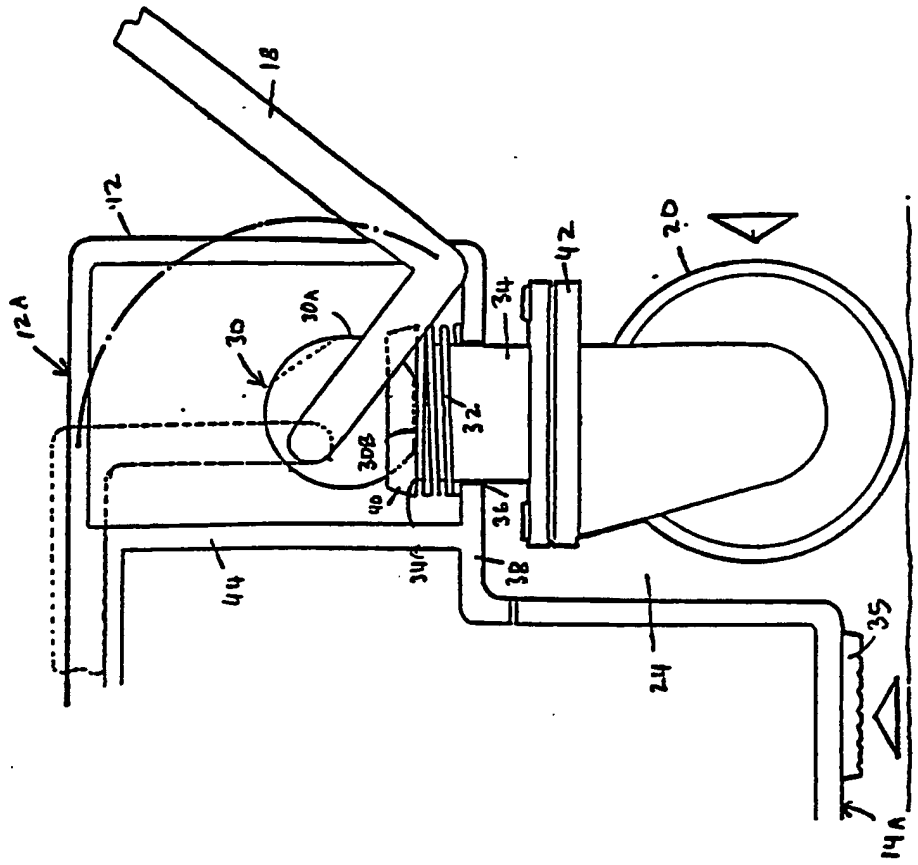


Fig 5 (a)



(b)



WHEELED SUITCASE

This invention relates to a suitcase with wheels.

5 It is known to fit wheels to a suitcase so that it  
can be used as a trolley. Generally, retractable wheels  
are provided to project outwardly beyond the lower major  
face of the suitcase body and a retractable handle is  
provided so as to be extendable upwardly from the upper  
10 major face of the suitcase body. In this way, the  
suitcase body can form the base of the trolley with the  
handle allowing the suitcase to be pushed or trailed by  
the user.

15 According to this invention, a suitcase of the kind  
referred to is provided with at least three wheels of  
which at least one is retractable and means for moving  
the retractable wheel in a direction generally  
perpendicular to the plane of the lower major face of  
20 the suitcase body, between an operative position in  
which the wheel can engage the ground and an inoperative  
position in which it is raised from the ground.

The means for moving the wheel into its operative  
25 position preferably comprises an eccentric cam device  
operable in response to movement of the handle from its  
retracted to its extended position.

The retractable wheel is preferably spring-biased  
30 towards its inoperative position and may be swivelable  
about an axis generally perpendicular to the lower major  
face of the suitcase body to allow steering of the  
trolley.

35 An embodiment of the invention will now be described by  
way of example with reference to the accompanying  
drawings in which:-

Figure 1 is a side view of a wheeled suitcase in accordance with the invention;

Figures 2a and 2b are views similar to Figure 1 showing the suitcase loaded with luggage and the handle partially extended, and fully extended into the operative position respectively;

Figure 3 is a topside plan view of the suitcase of Figure 1.

Figure 4 is an underside plan view of the suitcase of Figure 1; and

Figures 5a and 5b are cross-sectional views taken along the line A-A of Figure 4 showing the wheel retracted, and the wheel locked in the operative position respectively.

Referring to Figures 1 to 4, a wheeled suitcase comprises a suitcase body 10 having an upper lid 12 which is hinged in conventional manner on a lower section 14. The major face 12A of the upper lid has a groove 16 (Figure 3) of substantially U shape to receive a correspondingly shaped retractable handle 18, the groove having a cut-out portion 16A to allow access to the handle. As shown in Figure 4, the suitcase body has a rear wheel 20 and two front wheels 22, 22', each wheel being mounted with their axes of rotation parallel to the face 14A so that the suitcase body 10 forms the base of a trolley. The rear wheel 20 is retractable into a recess 24 formed in the lower body section 14 intermediate one end of the lower body section 14, and the front wheels 22, 22' are mounted in respective recesses 26, 26' formed in the lower body section 14 at the other end of the lower body section 4 and at the

corners thereof. The rear wheel 20 is provided with a swivel mounting 42 (Figure 5) so that the wheel can swivel through 360° about an axis perpendicular to the major face 14A to allow steering of the trolley.

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The handle 18 for pushing and steering the trolley formed by the wheeled suitcase has two arms 18A connected at one end by a cross-member 18B (Figure 3). Referring to Figure 5, the free ends of the arms 10 18A are pivotally mounted on the upper body section 14A within respective recesses 28, 28' formed therein at one end of the suitcase body 10 by virtue of being attached to the ends of a rotatable shaft (not shown) carrying an eccentric cam device 30, which shaft ends pass through 15 apertures (not shown) in the inner side wall of each of the recesses 28, 28'. The cam device 30 rotates with the shaft upon movement of the handle 18 between its retracted and extended portions. The cam device 30 has a curved surface 30A and a flat surface 30B allowing the 20 handle 18 to be both pivoted about the shaft axis and locked in an upright position as indicated by chain lines in Figures 5(a) and (b). The arms 18A of the handle are bent at the free ends thereof to allow the handle to lie parallel to the major face 12A when in 25 its retracted position. Thus, when the suitcase is no longer required to act as a trolley, the handle is swung over the body 10 to bring it within the groove 16.

A rubber friction pad 35 is attached to the major face 30 14A of the lower body section 14 near to the rear end of the suitcase body to act as a brake when the rear wheel 20 is retracted. An alternative brake for the trolley may be a brake control attached to the handle cross-member coupled to a Bowden cable to operate wheel brakes 35 (not shown).

Further details of the arrangement of the retractable wheel will now be described with reference to Figures 5 (a) and (b). The mechanism for causing the wheel 20 to move perpendicular to the plane of the major face 14A of the suitcase body 10 is located within the upper body section 14 above the wheel 20. The wheel 20 is connected to one end of a support bar 34 which is movable axially in an aperture 36 formed in the end wall 38 of the recess 24, in the downward direction by pivoting the handle 18 from its retracted to its extended position. The cam device 30 bears against the surface of the other end of the support bar 34. A coaxial compression spring 32 surrounding the support bar 34 acts between the inner surface of the end wall 38 of the recess 24 and a flange member 40 provided at the upper end of the support bar 34 to bias the wheel 20 associated with the support bar 34 upwardly to a retracted position.

When the handle is moved to its extended position, the curved surface 30A of the cam device 30 acts on the upper surface 34A of the support bar 34 causing the support bar 34 to move axially downward against the action of the coaxial compression spring 32 through the aperture 36 formed in the end wall 38 of the recess 24. When the extended position is reached (see Figure 5 (b)), the flat surface 30B of the cam device 30 engages the flat upper surface 34A of the support bar 34 thereby locking the support bar 34 and its associated wheel 20 in the extended position. As the handle 18 is attached to the shaft of the cam device 30, the handle is locked in the extended position at the same time as the wheel 20 is locked in its extended position in contact with the ground. As the handle 18 is moved back towards its retracted position, the flat cam surface 30B disengages from the upper surface 34A of the support bar 34 and



the curved surface 30A once again bears against the upper surface 34A. Pivoting of the cam device 30 about the shaft axis in the direction of handle movement allows the support bar 34 to be withdrawn by the spring  
5 into the upper body section 12. It is to be noted that the retractable wheel 20 projects below the plane of the major face 14A of the lower body section 14 when the handle 18 is pivoted through an angle greater than 90° from its retracted position and that the wheel 20 is  
10 locked in the operative position when the handle 18 is pivoted through an angle of approximately 120°. In this way, when the handle is in the upright position to allow the trolley to be loaded with luggage, the friction pad 35 is in contact with the ground to maintain the base of  
15 the trolley securely on the ground during loading.

The suitcase body 10 is hollow and acts as a conventional suitcase with the exception that part of the internal space is occupied by the recesses 24, 26,  
20 26' and by the wheel retraction mechanism, the mechanism being separated from the internal space by partitions 44. The major face 12A of the lid is covered with a non-slip material to prevent articles from slipping off the suitcase body when it is acting as the base of a  
25 trolley.

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CLAIMS

1. A wheeled suitcase, comprising at least three wheels of which at least one is retractable and means for moving the retractable wheel in a direction generally perpendicular to the plane of the lower major face of the suitcase body, between an operative position in which the wheel can engage the ground and an inoperative position in which it is raised from the ground.
2. A suitcase according to claim 1 further comprising a retractable handle, wherein the means for moving the wheel into its operative position is operable in response to movement of the handle from its retracted to its extended position.
3. A suitcase according to claim 1 or claim 2, wherein the means for moving the wheel between its operative and inoperative positions comprises an eccentric cam device.
4. A suitcase according to any one of claims 1 to 3, wherein the retractable wheel is spring-biased towards its inoperative position.
5. A suitcase according to any one of claims 1 to 4, wherein the retractable wheel is locked in its operative position.
6. A suitcase according to claims 2 to 5, wherein the handle is locked when in its extended position.
7. A suitcase according to claims 1 to 6, wherein the retractable wheel is swivelable about an axis generally perpendicular to the lower major face of the suitcase body to allow steering of the suitcase.

8. A suitcase according to claims 1 to 7, wherein the lower major face of the suitcase body is provided with a friction pad which is in contact with the ground to act as a brake when the retractable wheel is in its inoperative position.

9. A wheeled suitcase substantially as herein described with reference to the drawings.